

CLAIMS

What is claimed is:

1. A method of repetitively firing a flash lamp, said flash lamp having a self extinguishing voltage and a discharge time, said method comprising the steps of:

providing a power supply having a periodic voltage signal, said periodic voltage signal having a component where the voltage signal is less than said flash lamp self extinguishing voltage, said signal component being longer than said flash lamp discharge time;

providing a means for storing energy, said energy storage means being connected across the electrodes of said flash lamp and across said power supply;

charging said energy storage means with said power supply voltage signal;

firing said flash lamp when said power supply voltage signal is less than said flash lamp self extinguishing voltage and at a time such that said flash lamp de-ionizes while said power supply voltage signal remains below said self extinguishing voltage; and

repeating said charging and said firing steps.

2. The method of claim 2 further comprising the step of:

interrupting the current flow to said flash lamp before the voltage across said energy storage means falls below said flash lamp self extinguishing voltage.

3. A circuit for repetitively firing a flash lamp, said flash lamp having a self extinguishing voltage, said circuit comprising:
 - a means for storing energy having inputs for connection to a power supply having a periodic voltage signal, said means for storing energy connected across the electrodes of said flash lamp;
 - a means for triggering said flash lamp;
 - a means for detecting when the voltage of said periodic power supply signal falls below said flash lamp self extinguishing voltage;said voltage detecting means operative to trigger said triggering means thereby firing said flash lamp when said periodic power supply voltage signal is below said flash lamp self extinguishing voltage.
4. The circuit of claim 3 wherein said means for storing energy is a capacitor.
5. The circuit of claim 4 wherein said means for detecting is a zero crossing detector.
6. The circuit of claim 3 further comprising a means for interrupting the current flow to said flash lamp before the voltage across said energy storage means falls below said flash lamp self extinguishing voltage.
7. The circuit of claim 6 wherein said interrupting means is a voltage comparator comparing the voltage across said energy storage means to a predetermined voltage level, and a bipolar MOSFET in series with said flash lamp, said bipolar MOSFET

operatively connected to the output of said voltage comparator to turn off when said voltage across said energy storage means falls below said predetermined voltage level.

8. A method of repetitively firing a flash lamp, said flash lamp having a self extinguishing voltage in the range of 100 to 300 volts and a discharge time of 30 to 200 microseconds, said method comprising the steps of:

providing an AC power supply having a substantially 60 Hz sinusoidal voltage signal;

providing a means for storing energy, said energy storage means being connected across the electrodes of said flash lamp and across said power supply;

charging said energy storage means to substantially 2000 volts with said AC power supply;

firing said flash lamp when said power supply voltage signal is at substantially zero volts; and

repeating said charging and said firing steps.

9. A method of providing pulsed energy, said method comprising the steps of:

providing a power supply having a periodic voltage signal;

providing a means for storing energy, said energy storage means being connected across said power supply, said energy storage means having outputs for connection to an electrical device;

charging said energy storage means with said power supply voltage signal;

discharging said energy storage means into said electrical device at a time when said power supply voltage signal is below a first predetermined value;

interrupting the current flow to said electrical device before the voltage across said energy storage means falls below a second predetermined value; and

repeating said charging, discharging, and interrupting steps.

10. A circuit for providing pulsed energy, said circuit comprising:

a means for storing energy having inputs for connection to a power supply having a periodic voltage signal;

output terminals;

a means for interrupting a connection, said interrupting means connected between said energy storage means and said output terminals;

a means for detecting when said periodic voltage signal falls below a first predetermined value;

a means for detecting when the voltage across said energy storage means falls below a second predetermined value, said second predetermined value being greater than said first predetermined value;

said first predetermined value detecting means operative to close said interrupting means when said periodic voltage signal is below said first predetermined value whereby said energy storage means is dischargably connected to said output terminals;

said second predetermined value detecting means operative to

open said interrupting means when the voltage across the energy storage means falls below said second predetermined value whereby the discharge of said energy storage means is interrupted.

11. A circuit for repetitively firing a flash lamp, said flash lamp having a self extinguishing voltage, said circuit comprising:

an energy storage circuit having inputs for connection to a power supply having a periodic voltage signal, said energy storage circuit connected across the electrodes of said flash lamp;

a flash lamp triggering circuit operatively connected to trigger said flash lamp;

a voltage detection circuit operatively connected to said periodic power supply and said flash lamp triggering circuit, falls below said flash lamp self extinguishing voltage;

said voltage detection circuit operative to trigger said triggering circuit thereby firing said flash lamp when said power supply periodic voltage signal falls below said flash lamp self extinguishing voltage.

12. The circuit of claim 11 further comprising a current interruption circuit operatively connected to said flash lamp, said current interruption circuit operative to interrupt current flow through said flash lamp before the voltage across said energy storage circuit falls below said flash lamp self extinguishing voltage.

13. The circuit of claim 12 wherein said current interruption circuit has a voltage comparator circuit comparing the voltage across said energy storage circuit to a predetermined voltage level, said predetermined voltage level being greater than said flash lamp self extinguishing voltage, wherein said current interruption circuit also has a bipolar MOSFET in series with said flash lamp, said bipolar MOSFET operatively connected to the output of said voltage comparator circuit to turn off when said voltage across said energy storage circuit falls below said predetermined voltage level.